

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

RANDALL C. TORNO and
JANET TORNO,

Plaintiffs,

v.

Case No. 03-74091
Hon. Victoria A. Roberts

2SI, LLC., AMW CUYUNA ENGINE CO., INC.,
ROGER ZERKLE d/b/a ZDE ENTERPRISES,
and R.E. PHELON COMPANY, INC.

Defendants.

**ORDER CONCERNING PLAINTIFF'S MOTION IN LIMINE TO
PRECLUDE CERTAIN TESTIMONY OF DEFENDANT'S EXPERTS
AS SPECULATIVE AND SCIENTIFICALLY UNRELIABLE OPINION TESTIMONY**

I. INTRODUCTION

This matter is before the Court on Plaintiff's Motion in limine to preclude certain testimony of Defendant's experts as speculative and scientifically unreliable opinion testimony (Doc. #104). For the following reasons, the Court **DENIES** Plaintiff's Motion.

II. BACKGROUND

The underlying facts are sufficiently set forth in the Court's Order granting in part, and denying in part, Defendant Phelon's Motion for summary judgment entered May 10, 2006. [Doc. 141].

The Plaintiff's theory of how the engine failure occurred is based on Phelon's defective ignition trigger. An ignition trigger consists of a conductive metal pin surrounded by a coil of wire. The pin and coil are secured by epoxy inside a square

aluminum mounting unit. A metal protrusion from the crankshaft, called a “tang,” rotates within approximately ten thousandths of an inch from the ignition trigger pin. The rotating tang creates a magnetic impulse that causes an electric current to travel down the coil and signal another device to send a current to the spark plug, causing it to fire. The firing of the spark plug ignites the compressed fuel air mixture in the cylinder. Plaintiff’s engine had two cylinders.¹ When the cylinders fire they cause the crankshaft to spin. The crankshaft is geared to turn the two bladed propeller of the aircraft.

Plaintiff’s theory is that there was separation of the epoxy in the ignition trigger which allowed the coil to migrate outward slightly. When it migrated outward it closed the gap between itself and the tang. Plaintiff cites the scratch marks on the tang as evidence that it was contacted by the trigger coil. Plaintiff argues that the contact between the ignition coil and the tang disrupted the closed circuit between the ignition trigger and the spark plug, leaving the spark plug subject to alternative electrical influences (the so-called “antenna phenomena”).

To explain the engine failure, Plaintiff surmises that the signal that caused the spark plug from the properly functioning cylinder to fire, also caused the spark plug connected to the damaged coil to fire. According to Plaintiff, when the spark plug fired too early in the stroke, called preignition, it superheated the burning fuel. The temperatures melted a hole in the head of the piston in that cylinder, allegedly resulting in total engine failure. The parties dispute whether there was partial or total engine

¹The cylinders do not fire simultaneously. There is a piston inside each cylinder that compresses the fuel air mixture. The mixture is ignited when the piston is at the top of the stroke. When operating properly, the pistons are always at opposite ends of the stroke.

failure.

Defendant Phelon has a different theory to explain the engine failure. It claims that due to several errors in Plaintiff's construction of the aircraft, the engine ran "lean." "Lean" refers to the air-fuel mixture having too high a proportion of air to fuel when it enters the cylinder. The lean mixture was allegedly caused by Plaintiff's use of the wrong size fuel line, wrong type of fuel filter and alteration to the induction system. The lean mixture burned hotter, resulting in the piston crown melting in that cylinder. Phelon asserts that the other cylinder still functioned, so the propeller was still rotating. Presumably through Plaintiff's purported error to return to the runway rather than to glide to a landing straight ahead, the aircraft crashed. Phelon explains the scratches on the tang by arguing that the force of the impact shoved the backplate, to which the ignition trigger was attached, forward into the rotating tang. According to Phelon's theory, there was only one contact between the trigger and the tang.

Plaintiff filed his Motion on March 24, 2006, seeking to preclude defense experts from testifying on several issues; he claims the physical evidence and scientific principles do not support the experts' opinions.

III. STANDARD OF REVIEW

FRE 702 states:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

The Supreme Court held that it is the trial judge's responsibility to ensure that expert testimony admitted pursuant to FRE 702 is relevant and reliable. See *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) and *Kumho Tire Co., Ltd v. Carmichael*, 526 U.S. 137, 141 (1999).

“An expert’s opinion must be supported by more than subjective belief and unsupported speculation and should be supported by ‘good grounds’ based on what is known.” *McLean v. Ontario, Ltd.*, 224 F.3d 797, 800-801 (6th Cir. 2000)(citations omitted). “The expert’s conclusions regarding causation must have a basis in established fact and cannot be premised on mere suppositions...[h]owever, mere ‘weakness in the factual basis of an expert witness’ opinion bear on the weight of the evidence rather than on its admissibility.” *Id.* at 801 (citations omitted).

IV. APPLICABLE LAW AND ANALYSIS

Plaintiff seeks to preclude the defense experts’ testimony on two issues. First, Plaintiff argues they should not be allowed to testify that the propeller was rotating at the time of impact, with that rotation at impact causing a single contact between the trigger coil and the tang. He asserts the lack of damage to the second propeller blade indicates it could not have been rotating at impact, and notes that there are several scratches on the tang.

Second, Plaintiff seeks to preclude defense experts from testifying that the engine was running “lean.” He contends it is speculation that the engine ran lean, particularly because Plaintiff’s fuel filter was tested four years after the accident, making the data unreliable.

Plaintiff does not challenge the qualifications of any of Defendants’ experts.

A. The Propeller

Plaintiff claims there is no factual basis for defense experts' contention that the propeller was rotating on impact.

Plaintiff criticizes Moore's testing because he dropped a non-rotating propeller at a 45 degree angle to assess the damage to the blades. Moore claimed the damage pattern was different from that of Plaintiff's blades, and concluded that Plaintiff's blades were not stationary (non-rotating) at the time of impact.

Plaintiff challenges the angle that the propeller was dropped because there is eye witness testimony that the aircraft crashed nose down. [Exhibit 21, p. 38; Exhibit 22, p. 7]. Moore explains that he dropped the propeller vertically, but the dirt hills it fell to were graded to 45 degrees because, based on the damage to Plaintiff's aircraft, that was a reasonable contact angle. [Exhibit 25, p. 49-50].

Plaintiff also takes issue with the fact that Moore's test blades were not rotating at impact as Plaintiff's allegedly were. Moore claims it was not feasible to build an aircraft to the same specifications, create a hole in one of the pistons and drop it with the propeller rotating. [Exhibit 25, p. 50-51]. Moore testified that the results from his test were substantially similar to what would have happened if Plaintiff's propeller was not rotating at impact. [Exhibit 25, p. 52].

Essentially, Plaintiff argues Moore should have recreated the conditions of the crash to prove that the damage to the propeller is consistent with Defendants' theory that the propeller was rotating at impact. Instead, based on the purported unfeasibility of recreating the conditions of a rotating propeller, Moore recreated the condition in accordance with Plaintiff's theory of non-rotation. Moore contends that the damage

pattern he obtained is not consistent with what he observed from Plaintiff's actual aircraft. He relied on these findings in concluding that the propeller was rotating at the time of impact.

Moore's test satisfies the requirements of FRE 702. Based on the facts and data regarding the crash and his own observations, Moore recreated the impact of the propeller without rotation and used the information to make a comparison with the propeller from Plaintiff's actual crash. After physical examination, Moore testified that he believed the damage to the propeller blades was consistent with rotation on impact because of the location of the compression fracture. [Exhibit 25, pp. 57-60]. As noted above, "mere weakness in the factual basis of an expert witness' opinion bear on the weight of the evidence rather than on its admissibility." *McLean*, 224 F.3d at 801.

Moreover, there is eyewitness testimony that supports Moore's conclusion that the propeller was rotating at impact. Thomas Rahe, a witness to the crash, testified that he heard the power drop from full power to around half. [Exhibit 21, p. 31]. This is consistent with Defendants' theory that the engine only partially failed. If the other cylinder was still operating, it would rotate the propeller.

Plaintiff also seeks to preclude testimony that the propeller had a tip speed of 180 mph at impact. Moore never testified to a tip speed of 180mph. Plaintiff calculated the tip speed from Moore's estimation of the RPM of the propeller and its dimensions. However, Moore did not concretely testify to the RPM:

- Q. With regard to the propeller, your opinion is that it was rotating at the time of impact with the ground, what was the speed or RPM of that propeller rotation?
- A. That is not known. You can't tell from the evidence that we have.

Q. What range do you believe it to be?

A. I would say on order, if you want a ballpark estimate, on order of a thousand RPM.

[Exhibit 25, p. 24].

B. The Tang

Plaintiff moves to prohibit expert testimony that there was only one contact between the tang and the coil, as Defendants allege, because there are several scratches on the tang at depths Plaintiff claims are inconsistent with Defendants' expert testimony.

Dr. Maureen Reitman ("Reitman") testified that following physical inspection and analysis of the evidence, particularly the damaged ignition trigger and the tang, she concluded Plaintiff's theory is not consistent with the marks on the tang. [Exhibit 27, pp. 70-72]. Defendants do not allege there was only one *mark* on the tang, rather, they allege there was only one *impact* with it. Consequently, Reitman's testimony is not inconsistent with the physical evidence.

Plaintiff also asserts that because the CMM² measurements, as acknowledged by Moore, stated the backplate that the ignition trigger was attached to moved forward by fifty thousandths of an inch, and the gap between the tang and the ignition trigger by manufacture was ten thousandths of an inch - the depth of the marks should be forty thousandths of an inch if Defendants' theory is correct. Because the depth is presumably not forty thousandths of an inch, Plaintiff claims expert testimony that there

²The parties do not state what the acronym CMM means. However, the CMM measurements appear to be an objective set of measurements accepted by both parties.

was a single contact between the ignition trigger and the tang should be precluded because it is not supported by the facts.

However, Plaintiff ignores Moore's testimony that the depth would not be forty thousandths because the contact between the ignition trigger pin and the tang was not perpendicular. Moore claims that due to the direction of movement from the backplate and the rotation of the tang, there would not be a 90 degree contact between the ignition trigger pin and the tang. [Exhibit 25, pp. 33-39]. Moore constructed an animation to demonstrate the angle that the contact likely occurred. According to Moore, the angle was consistent with the damage observed on the ignition trigger. [Exhibit 25, pp. 38-39].

Moore and Reitman's testimony that the marks on the tang are consistent with a theory of a single contact is admissible under FRE 702. The testimony is based on their physical examination of the evidence and calculation of the trajectory of the contact.

C. Lean Fuel

Plaintiff claims expert testimony that his aircraft's engine failure was caused by operating with lean fuel is inadmissible because there are no facts or data to support that conclusion. Specifically, Plaintiff challenges the methodology used to determine that his fuel filter was clogged at the time of the accident. Experts tested Plaintiff's fuel filter and determined that it allowed significantly less fuel to pass than it was supposed to. However, the test was conducted four years after the accident. According to Plaintiff, the elapsed time prevented the fuel filter from being an accurate gauge of the amount of fuel that passed at the time of the accident.

In their Response, Defendants do not address the allegation that it was not a

reliable means to test the porosity of the fuel filter by testing it after it was sitting for four years. However, in Moore's expert report, he noted that in order to test the effects of Plaintiff's modifications to the engine, he tested the fuel flow capacity and found:

[w]ith no filter at all, the fuel supply system delivered approximately 12 GPH. With a new fuel filter of the same part number and same supplier as those used by [Plaintiff], the fuel supply system delivered approximately 8 GPH. With the subject fuel filter, 1.6 GPH was delivered. The 2SI manual...[states]...the engine requires 5.5 GPH at full power.

It is undisputed that Plaintiff installed a new fuel filter and only flew four hours with it prior to the accident. There is no explanation for why a brand new fuel filter allowed 8 GPH, and Plaintiff's, with only four hours of use, allowed 1.6 GPH, other than the fact that it sat for four years. Defendants experts offer no explanation or justification for relying on the porosity measurements of a fuel filter that went through a crash and then sat for four years. However, in determining the admissibility of expert testimony under FRE 702, "the focus...must be solely on principles and methodology, not in the conclusions that they generate." *Daubert*, 509 U.S. at 595. Plaintiff does not challenge Moore's methods, only his conclusions. Accordingly, testimony that testing of Plaintiff's fuel filter revealed a significantly decreased flow will not be precluded under FRE 702.

In addition to the test of the four year old fuel filter, Defendants' experts will not be precluded from testifying that Plaintiff's engine failed because it ran lean based on other evidence. Moore noted the absence of carbon on the spark plugs, forward cylinder head and piston. [Moore Report, p. 8]. He also pointed out that Plaintiff altered the induction system and used the wrong type of fuel filter and fuel line. [Moore Report, p. 9].

Plaintiff claims the change to the induction system was the installation of a two

foot tube bent at a right angle. He claims it would restrict air flow, thus causing the engine to run rich, not lean. But, Moore testified that although air intake would be restricted it would not be evenly distributed between the cylinders and could change the tuning of the induction system. [Exhibit 25, p. 206].

“Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence. Additionally, in the event the trial court concludes the scintilla of evidence presented supporting a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true, the court remains free to direct a judgment, and likewise to grant summary judgment.” *Daubert*, 509 U.S. at 596 (citations omitted).

Consequently, expert testimony that Plaintiff’s engine ran lean is admissible under FRE 702.

V. CONCLUSION

For the foregoing reasons, the Court **DENIES** Plaintiff’s Motion in limine to preclude certain testimony of Defendants’ experts.

IT IS SO ORDERED.

s/Victoria A. Roberts
Victoria A. Roberts
United States District Judge

Dated: May 30, 2006

The undersigned certifies that a copy of this document was served on the attorneys of record by electronic means or U.S. Mail on May 30, 2006.

s/Linda Vertriest

Deputy Clerk